BLI

Lab Test Report

A Comprehensive BLI Laboratory Evaluation | MARCH 2009

EUROPEAN EDITION

Dell 5330dn Workgroup Laser Printer

48 PPM Laser Printer

2009 BUYERS LABORATORY BLI RECOMMENDED LAB TESTED

Reliability	Good
Administrative Utilities	Very Good
Feedback to Workstations	Excellent
Ease of Network Setup	Very Good
Print Drivers	Good
Applications Compatibility	Excellent
Print Quality	Very Good
Productivity	Good
Ease of Use	Very Good
Feature Set	Good
Security Features	Not Rated
Environmental Features	Not Rated
Toner Yield	Fair

PERFORMANCE SUMMARY

The Dell 5330dn Workgroup Laser Printer gave a good overall performance in its lab evaluation. With a rated speed of 48 ppm, the A4 desktop laser printer, which is very easy to set up and use, demonstrated good reliability throughout its 125,000-impression durability test, with four misfeeds and no malfunctions recorded. Additionally, the unit offers very good image quality, competitive productivity and has a tested toner yield that exceeded the rated yield. Based on these findings, BLI recommends the 5330dn Workgroup Laser Printer for offices with monthly print volumes of up to 15,000 impressions.

Test duration:
Two months, including a 125,000-impression durability test.

Maximum monthly duty cycle:
Up to 250,000 impressions.

Manufacturer's recommended monthly volume:
4,000 to 16,000 impressions.

BLI's recommended monthly volume for optimum performance:
Up to 15,000 impressions.

More information on the Dell 5330dn Workgroup Laser Printer is available through bliQ (www.buyerslab.com/bliQ).

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Strengths

- Reliable
- Print cartridges exceeded rated yield
- Above average job stream efficiency when using the PCL driver
- Highest efficiency when printing multiple sets in simplex mode
- Above average overall print quality
- Straightforward procedure for adjusting paper drawers
- Standard automatic duplexing
- Optional wireless connectivity
- Highly automated driver installation routine

Weaknesses

- Below average job stream efficiency when using the PostScript driver
- Slower than average first-print time out of energy-save mode
- Below average tested toner yield when compared with competitive models
- Below average standard paper capacity

PERFORMANCE OVERVIEW

+, – and ○ represent positive, negative and neutral attributes, respectively.

△▽

RELIABILITY

GOOD

○ The 5330dn Workgroup Laser Printer is certified reliable by BLI, completing a 125,000-impression durability test with four misfeeds for a misfeed rate of 1 per 31,250 impressions. Moreover, it required no service of any kind. Furthermore, the device went on to produce an additional 25,000 impressions without any problems.

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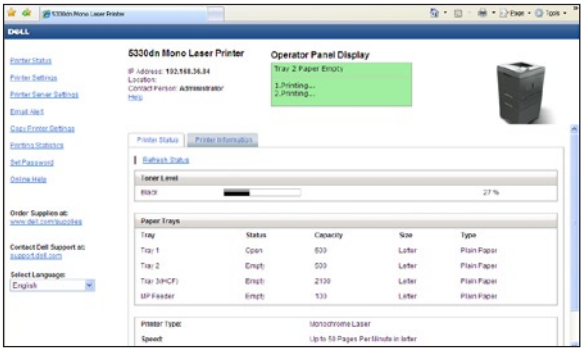
ADMINISTRATIVE UTILITIES

VERY GOOD

○ Dell OpenManage Printer Manager allows administrators to remotely manage multiple Dell and compatible devices on the network via a Web browser. Though the fleet management utility provides great detail about Dell devices, its capabilities in terms of compatibles is more limited than with other competitive tools. OpenManage Printer Manager is available as a download on Dell's Web site.

+ The embedded Web page, Dell Web Printer Configuration Tool, lets administrators configure the unit remotely on the network and monitor paper status—"Okay" or "Add Paper"—and remaining toner, as indicated in percent gauges.



Embedded Web Page (U.S. model pictured)

+ Printer Status Monitor (PSM) is either resident or activated manually, displaying information for devices that have bi-directional support enabled. Administrators and users can proactively check PSM for status, names of print jobs, level of toner supply, guidance for reordering toner and the user's manual for troubleshooting details.

○ Administrators can set up e-mail alerts so that key operators receive messages when consumables are depleted or an error has occurred.

FEEDBACK TO WORKSTATIONS

EXCELLENT

+ PSM is installed simultaneously with the driver and allows for configuring pop-up messages or icon alerts to notify users of errors and warnings. When a job is sent, the utility pops up so that users can see paper status—"Ready" or "Empty"—and remaining toner, as indicated in a percent gauge and provides a trouble shooting guide ("Help Me") and a link to the users guide. It can also be proactively accessed.

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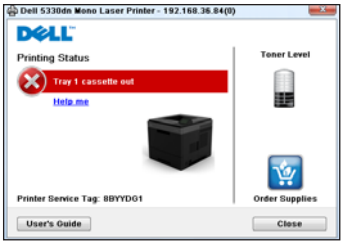

Printing Status (U.S. model pictured)

+ Users can enable the pop-ups to appear during printing or disable the functionality altogether.

+ Pop-ups for print job completion are available, but this is common among devices in this class.

△ EASE OF NETWORK SETUP — VERY GOOD

+ Physical setup is simple as the 5330dn Workgroup Laser Printer stacks on top of the optional paper drawers, but note that Dell recommends at least two people lift the unit out of the box and place it in the desired location due to size and weight concerns. Users can then remove the packing tape and open the top cover to access the pre-loaded toner cartridge.

+ The CD launches upon insertion in the drive, and the automated installation routine will have users up and running in a matter of minutes. It takes six clicks to simultaneously install the PCL and PostScript drivers, as well as included software, using the default routine; the port is automatically created, and the IP address is assigned using DHCP. Furthermore, the drivers automatically detect configured accessories.

+ Dell provides a utility whereby administrators can remotely install the drivers on workstations for uniform operation across the organization.

○ The CD contains the drivers, Dell Toner Management System and other support tools, as well as a user's manual in PDF format so that it can be printed.

○ OpenManage Printer Manager can be downloaded from Dell's Web site.

△▽ PRINT DRIVERS — GOOD

+ The 5330dn Workgroup Laser Printer ships with PCL 6 and PostScript 3 drivers for various Windows and Mac operating systems, as well as environments that run Linux

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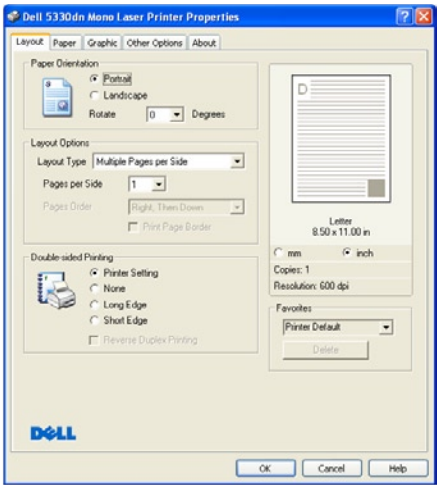
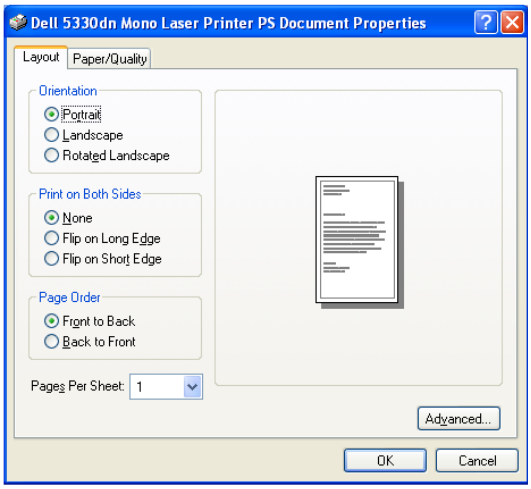
or UNIX. The drivers, which were tested on a Windows XP platform, were well laid out and easy to use.

○ The most commonly used features for a typical print job are located on two separate tabs in the PCL driver. Duplex and orientation are available on the Layout tab, quantity and paper size are on the Paper tab.

○ The PCL and PostScript drivers are different in appearance. The PCL driver is graphical, while the PostScript driver is text-based, which makes it more difficult for users who switch between them.



PCL Driver Layout Tab (U.S. model pictured)



PostScript Driver Layout Tab (U.S. model pictured)

○ The drivers, which have a good overall feature set compared to A4 monochrome laser/LED printers in this speed range and class, both include booklet and N-up—2 to 16—printing; quantity selection up to 999; proof print and secure print. The PCL driver has auto reduction and enlargement, while the PostScript driver includes reduction and enlargement from 1 to 1,000 percent and mirror image. The PCL driver adds the ability to save settings and watermarks.

○ Although not uncommon, collate failed to work during testing when selected from the PostScript driver.

— File size increases from one set printed using a 10-page document when producing multiple collated sets with collate selected from the print screen within the application.

△ APPLICATIONS COMPATIBILITY — EXCELLENT

+ No problems were experienced with any of the test files used in the applications compatibility tests. Units are tested for compatibility on a Windows 2000 platform

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with Microsoft Word 2000, PowerPoint 2000 and Excel 2000, as well as Adobe PageMaker 7.0, Photoshop 6.0 and Acrobat 6.0, using 25 application test files that contain text, graphics, halftone images, tables, etc., that enable BLI technicians to evaluate memory usage, file processing, font rendering and greyscale capability.

PRINT QUALITY — VERY GOOD

○ The Dell 5330dn Workgroup Laser printer was tested at the default 600-dpi resolution.

\+ Solids, which were rated excellent, received above average ratings for darkness and consistent coverage.

\+ Text and halftone range were rated very good. Text, which did not exhibit any toner overspray when viewed without magnification, received high marks for darkness, fully formed characters and the smoothness of curves and serifs, while sharpness is rated average. Halftones were visible over a very good range (1% to 95%) with distinct separation between all levels.

○ Line art and halftone pattern were rated good. Separation of closely spaced fine lines were rated above average, while stair-stepping of diagonal lines, as well as consistency of line thickness and circle formation, were average. Halftone pattern, which did not display any banding, exhibited an average amount of graininess.

PRODUCTIVITY — GOOD

\+ The 5330dn Workgroup Laser Printer's efficiency when using the PCL driver to print BLI's job stream, which replicates typical traffic in a multi-user environment, is above average compared to A4 monochrome laser/LED printers in this speed range and class tested to date. In fact, it's the second highest.

— When using the PostScript driver to print BLI's job stream, the device's efficiency is below average due to the unit pausing between jobs in the test suite.

\+ The unit's efficiency when using the PCL driver to print multiple sets, at 89% of its rated speed, is above average in simplex mode, and, at 61% of its rated speed, competitive in duplex mode. Note that the unit's efficiency in simplex mode is the highest for competitive models and in duplex mode, its efficiency is the second highest.

○ The 5330dn Workgroup Laser Printer's first-print times for all test documents are competitive for the group.

— The unit's first-print time out of energy-save mode is slower than the average for tested models.

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EASE OF USE

VERY GOOD

○ The control panel features a 63.5 mm x 31.8 mm four-line, 40-character LCD. There are eight hard keys—Back, Menu, Enter, Cancel and left, right, up and down arrows—and one LED—Status.

Dell 5330dn Control Panel (U.S. model pictured)

+ The unit is easy to use from the desktop via the well-laid-out drivers.

+ Adjusting drawers for different-size media is straightforward. Users simply squeeze the width guide; the guide doesn't have to be removed and reinserted. Furthermore, the side guides move in sync and can easily be adjusted for different widths.

+ Removing misfeeds from any of the four access locations is easy. Users are prompted on the display that there's a misfeed and then by pressing the "Enter" key are instructed how to remove it. The toner cartridge might have to be removed to access a misfeed in that part of the unit.

+ Replacing the print cartridge is clean and straightforward: users lift up the top cover, then simply pull out the old cartridge and insert the new one.

FEATURE SET

GOOD

○ The 5330dn Workgroup Laser Printer's standard memory capacity of 256 MB is above average, while its maximum memory capacity of 768 MB is competitive compared to A4 monochrome laser/LED printers in this speed range and class.

— The unit's standard paper capacity of 600 sheets is below average for the group.

○ The unit's maximum paper capacity of 3,200 sheets is competitive.

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○ The 5330dn Workgroup Laser Printer's bypass tray capacity of 100 sheets is competitive for the group.

— The drawers supports 60 to 120 gsm, which is below average paper handling ability for the group.

+ The bypass handles thick paper up to 210 gsm, which is a heavier weight than is accommodated by most competitive models.

○ The unit's output capacity of 250 sheets is below average for the group; however, an optional output expander increases output capacity by 600 sheets.

+ Automatic duplexing is standard.

+ Wireless connectivity is available as an option.

△ SECURITY FEATURES

NOT RATED

Administrator password length (characters)	8 alphanumeric
AUTHENTICATION	
Network user authentication	No
Windows	No
Novell NetWare NDPS	No
LDAP authentication	No
802.1x wireless authentication	Yes
Kerberos protocol support	No
Authentication via department or user ID codes that are registered on the machine	No
Number of codes	Not applicable
Restrict usage of colour	No
Restrict usage of other features	No
Authenticated printing	No
Common Criteria Certification	No
Control panel lock/disablement	Yes
Digital user signature	No
Encrypted PDF mode/encrypted scanning	No
Encrypted secure print	Yes (when opt. HDD is installed)
Hard drive encryption	Yes (when opt. HDD is installed)
Hard drive lock	No
Hard drive overwrite	Yes
Max number of overwrites after every job	3
Overwrite method	Complement of pattern data
IP address filtering	Yes
IPsec	Yes
Job logs (e.g., activity monitoring, compliance auditing)	Yes

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MAC address filtering	No
Password-protected mailboxes	Not applicable
Password-protected Web page	Yes
Port disablement	Yes
Protocol disablement	Yes
Removable hard drive	Yes
Secure print	Yes
Secure Sockets Layer (SSL)	Yes
SNMPv3 support	Yes
Third-party security features	No
Transport layer security	Yes
Unauthorised copy prevention (secure watermark)	Not applicable
USB block	Information not available
Additional security features	On-demand image overwrite for HDD

ENVIRONMENTAL FEATURES

NOT RATED

Specified capable of running 30% post-consumer recycled paper	Yes
Specified capable of running 50% post-consumer recycled paper	Yes
Specified capable of running 100% post-consumer recycled paper	Yes
Instant/Quick Fusing	Yes (in draft mode)
Duplexing	Standard
Toner-save mode	INA
Energy-save mode/modes	Yes
Eco-Label Certifications	
Germany Blue Angel	Yes
ENERGY STAR	Yes
WEEE Directive compliant	Yes
RoHS compliant	Yes
Directive 2005/32/EC (Energy-using Products)	Yes
Montreal Protocol	Yes
Recycled materials/parts used in the product	INA
Product designed for recycling (easily disassembled, no binding agents)	Yes
Hardware remanufacturing program for this product	INA
Toner cartridge recycling program for this product	INA
Pre-paid label for return of toner cartridges/bottles for this unit	INA
Toner recycling system	INA
Ability to program features such as duplexing and auto shut-off over entire fleet	Yes
Polyvinyl Chloride used in any aspect of the product or its packaging	INA
Recyclable packaging materials for the product	Yes
Recyclable packaging materials for its consumables	Yes
Packaging materials used	INA
Tested energy consumption levels of the device (in watts):	
Power	INA
Standby	11.5

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During Printing	665
Emissions output from this device for the following substances (in mg/h):	
Ozone	‹0.1
Styrene	0.474
Benzene	‹0.03
TVOC	9.78
Dust	2.7

TONER YIELD

FAIR

— The 5330dn Workgroup Laser Printer's tested toner yield is below average compared to A4 monochrome laser/LED printers in this speed range and class tested to date.

+ The average of the two tested print cartridges exceeded the rated yield by about 2,500 impressions.

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SUPPORTING TEST DATA

Test Environment

The product has been tested in BLI's 929-square-metre test lab, in an environment monitored by a Honeywell Temp/RH chart recorder, which replicates typical office conditions.

Test Equipment

BLI's dedicated test network, consisting of Windows 2000 servers, Windows XP workstations, 10/100BaseTX network switches and CAT5 cabling.

Test Duration

Products are tested for two months, a portion of which consists of a durability test during which the product is run at half of its manufacturer-rated maximum monthly volume, with varying daily test volumes designed to replicate real-world use over an eight-hour workday. This variable schedule includes a mix of various-size documents, simplex and duplex modes, and a mix of short, moderate and long run lengths, and on/off cycles, throughout the day.

Tested Configuration

Dell 5330dn Workgroup Laser Printer base model.

Test Procedures

The test methods and procedures employed by BLI in its lab testing include BLI's proprietary procedures and industry-standard test procedures, which include a BLI-developed variation of ASTM's 1318-90 Test Method for Determination of Productivity using Electrostatic Copy Machines. In addition to a number of proprietary test documents, BLI uses an industry-standard KATUN test original for evaluating black image quality and test suites from Quality Logic to evaluate applications compatibility. In addition to a visual observation under a Graphiclite D5000 Standard Viewer, colour print quality is tested using a colour test target, which is read using the X-Rite Eye-One/iO Colour Spectrophotometer, and samples are analysed using the CIE XY Chromaticity Diagram. In addition, density of black and colour output is measured using an X-Rite 500 Series Densitometer. Georgia-Pacific Spectrum Multi-Use Paper is used in the tests, 10 percent of which is recycled paper containing 30 percent post-consumer content. Image quality is tested using Georgia-Pacific Printing Paper.

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RELIABILITY

PMs/Malfunctions	Service Required	Meter Count (Impressions)	Impressions Between Service
Meter Count (Beginning of Test)		0	
End of Test Period		125,000	
Total Misfeeds/Misfeed Rate	4/1 per 31,250 impressions		
Total Service Calls	0		

ADMINISTRATIVE UTILITIES

Included Software:

Dell OpenManage Printer Manager allows administrators to remotely manage multiple Dell and compatible devices on the network via a Web browser. Though the fleet management utility provides great detail about Dell devices, its capabilities in terms of compatibles is more limited than with other competitive tools. OpenManage Printer Manager is available as a download on Dell's Web site.

Printer Status Monitor (PSM) is either resident or activated manually, displaying information for devices that have bi-directional support enabled. Administrators and users can proactively check PSM for status, names of the print jobs, level of toner supply, guidance for reordering toner and the user's manual for troubleshooting details.

PSM is installed simultaneously with the driver and allows for pop-up messages or icon alerts, which notify users of errors and warnings, to be configured. When a job is sent, the utility pops up so that users can see paper status—"Ready" or "Empty"—and remaining toner, as indicated in a percent gauge. Users can enable the pop-ups to appear during printing or disable the functionality altogether. PSM can also be proactively accessed.

The Printer Information menu under the Printer Status tab displays device information, including the service tag number, the printer serial number, the asset tag number, memory capacity, processor speed and firmware version. The Printer Settings Report tab includes three sub-menus: Printer Settings Report, Print Settings and Maintenance. Printer Settings Report includes information on the paper size and type and print, account and error history. The setup menu under the Printer Settings tab provides such information as language, time before the unit goes into power-save mode and a toner-low alert (on/off). Maintenance enables updating of print server firmware. The Print Server Settings tab displays the IP Address, Subnet Mask and Gateway Address.

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Embedded Web page:

The embedded Web page, Dell Web Printer Configuration Tool, lets administrators configure the unit remotely on the network and monitor paper status—"Ready" or "Empty"—and remaining toner, as indicated in a percent gauge.

Consumables monitoring:

Yes, via PSM or the embedded Web page.

PRINT DRIVERS

Dell 5330dn Workgroup Laser Printer Print Driver Features

Features	PCL XL	PostScript 3
Auto Feature/Device Detection	Yes	Yes
Booklet Printing	Yes	Yes
Collate Sets	No	Yes*
Max Paper Sources per Job	2	1
Mirror Image	No	Yes
Negative Image	No	Yes
N-up Printing	2 to 16	2 to 16
Overlays	Yes	No
Paper Gauge	No	No
Print and Hold	No	No
Proof Print	Yes	Yes
Quantity Selection	1 to 999	1 to 999
Reduction/Enlargement	Auto; 25% - 400%	1% to 1,000%
Resolution Modes (dpi)	Best, Normal Draft: 600; 1200	600; 1200
Save Settings	Yes	No
Secure Print	Yes	Yes
Watermarks/Custom Watermarks	Yes/Yes	No/No
Toner Save	No	No

* Although there's a collate selection in the driver, it didn't function in testing; collate must be selected from the Windows print screen within the application for output to be collated. This is common as most are written to allow the application settings to override the driver's.

Send once/print many:

Yes. When collate is selected from the print screen within the application, file size increased. Output was properly collated.

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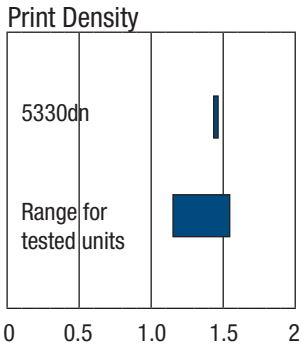
PRINT QUALITY

Text	Very Good
Line Art	Good
Halftone Pattern	Good
Halftone Range	Very Good
Solids	Excellent

Print Density

Dell 5330dn Workgroup Laser Printer	Density for units in this class tested to date
1.43 to 1.47	1.15 to 1.54

Measurements are based on four readings corresponding to four different solid black locations on the output. The higher the density reading, the darker the image.



Halftone Range

	Visible halftone range
Dell 5330dn Workgroup Laser Printer	1% to 95%
Typical range for competitive units	3% to 94%

The halftone test target contains blocks of increasing halftone dot-fill levels (1% to 100% in 1% increments).

PRODUCTIVITY

First-Print Time from Energy-Save Mode (Seconds)

Dell 5330dn Workgroup Laser Printer	Average for units in this class tested to date
31.54	22.72

Device sits idle overnight; a single-page black Word document is sent to the device; first-print time indicates the time it took to RIP, image and deliver the first page of the test document to the output tray.

First-Print Times (Seconds)

Windows XP	Word	PowerPoint	Photoshop	Acrobat	Photoshop
File Type	Black Text	Colour Graphic/Text	Colour Graphic	Black Graphic/Text	Colour Graphic
File Extension	DOC	PPT	TIF	PDF	JPG
Pre-Raster File Size	114 KB	99 KB	20 MB	426 KB	245 KB
Post-Raster File Size	11.8 KB	74.7 KB	4.95 MB	538 MB	269 KB
First-Page Time	8.38	10.53	12.66	11.12	8.28

First-print time indicates the time it took to RIP, image and deliver the first page of the test document set to the output tray. The unit's print speeds were tested at the default 600 dpi using the PCL 6 driver.

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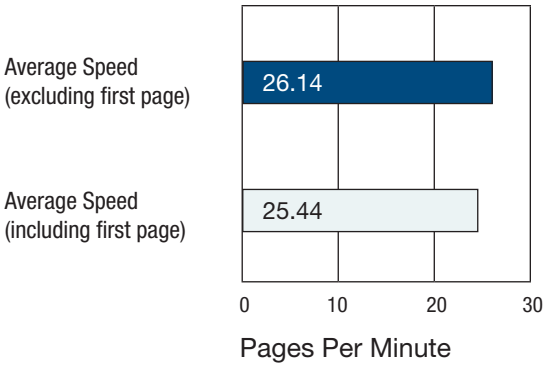
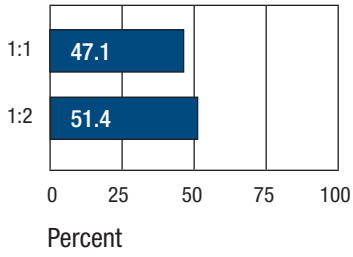
Dell 5330dn Workgroup Laser Printer's rated speed:
48 ppm

BLI's Tested Print Speeds



Print speed is tested using BLI's Monochrome Test Original with 6% page coverage. The test page is printed in a quantity equal to double the vendor's rated print speed for the device in each mode tested (e.g., if the vendor's rated print speed is 20 ppm, 40 pages are printed). The unit's print speeds were tested at the default 600 dpi using the PCL 6 driver.

Overall Efficiency



BLI obtains the overall efficiency percentage by dividing the tested speed of the device by the rated speed and then multiplying by 100 for each run length. All jobs are based on a 10-page document printed at the default 600 dpi using the PCL 6 driver.

Black Print Efficiency for Multiple Sets

Sets	Time	PPM	Efficiency	Overall Efficiency
PRINT 1:1 PCL 6				
1	0:28.69	20.9	43.6%	43.6%
5	1:55.10	26.1	54.3%	49.0%
10	4:31.19	22.1	46.1%	48.0%
20	9:24.41	21.3	44.3%	47.1%
PRINT 1:2 PCL 6				
1	0:30.56	19.6	40.9%	40.9%
5	1:57.22	25.6	53.3%	47.1%
10	3:46.56	26.5	55.2%	49.8%
20	7:25.50	26.9	56.1%	51.4%

Efficiency is tested using a 10-page document in black mode. In print mode, the document is printed at the default 600 dpi using the PCL 6 driver.

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Job Stream

BLI's job stream includes Word documents, Outlook e-mail messages, Excel spreadsheets, PowerPoint, HTML and Acrobat PDF files, totalling 19 pages. This test simulates the type of traffic a typical device might experience in a real-world, multi-user environment. All of the files are sent to the printer as a group, at which time the stopwatch begins; timing ends when the last page of the last file exits the device. Job stream efficiency is determined by the percentage of the rated speed at which the unit operates when producing real-world jobs. The closer the rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Job Stream in Black Mode:

The unit completed the job stream using the PostScript 3 driver in 1 minutes 13.84 seconds, running at 15.4 ppm, which translates to an efficiency rate of 32.2%.
The unit completed the job stream using the PCL 6 driver in 41.44 seconds, running at 27.5 ppm, which translates to an efficiency rate of 57.3%.

Problems encountered:

The device pauses between jobs when using the PostScript driver.

TONER YIELD

Tested Toner Yield

Colour	Rated Toner Yield (Impressions)	Tested Toner Yield (Impressions)	Net Weight (Grams)	Impressions per Gram
Black	20,000	22,505	450.7	49.93

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Certificate of Reliability

Awarded to

DELL INC.

for the performance of the

Dell 5330dn Workgroup Laser Printer

in BLI's in-house durability test.

Anthony F. Polifrone
Managing Director

March 2009
Date

This is to certify that when subjected to a 125,000-impression Buyers Lab durability test in a networked environment, the Dell 5330dn Workgroup Laser Printer proved to be a reliable product.

BUYERS LABORATORY INC.

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